

# Evaluating issues and outcomes associated with public–private partnership housing project delivery

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# **Evaluating issues and outcomes associated with housing public-private partnership project delivery: Tanzanian practitioners' preliminary observations**

**Abstract:** Public-private partnerships (PPPs) are being viewed as the next best alternative procurement option in the construction sector, particularly in developing countries such as Tanzania. This preliminary study aims to investigate the following aspects of housing PPP (HPPP) project delivery: (1) cost and affordability; (2) the influence of sustainability factors; and (3) the associated benefits which, despite the plethora of PPP-related studies, few have specifically examined. To achieve these objectives, a questionnaire survey was conducted with 28 stakeholders from Tanzania. Frequency analysis and one-sample *t*-tests were used to rank and identify the significant factors and outcomes of HPPP adoption. The most critical cost and affordability factors were that PPP procurement: (1) is economical compared to traditional methods; (2) offers value for money; and (3) can facilitate affordable housing supply outcomes. The major sustainability factors were beginning sustainability assessment from the feasibility stage and considering sustainability in project viability evaluation. Encouraging private sector innovation and management skills, risk sharing and value for money were found to be among HPPP delivery benefits. These findings provide insights for PPP policy and practitioners in understanding the significant factors in HPPP delivery.

**Keywords:** Housing projects, public-private partnerships (PPPs), Tanzania, public and private agencies, benefits, cost and affordability, sustainability

## **Introduction**

Housing is one of the basic human needs. Affordable housing has been a major issue and concern of governments in many developing countries, particularly in sub-Saharan Africa (UN-HABITAT 2011). Public-private partnerships (PPPs) have been considered the best way of sharing and minimising the risks related to investing in housing delivery for low-income people (UN-HABITAT 2011). According to Jin and Doloi (2008, cited in Osei-Kyei and Chan 2015), allocating and sharing risks have always been one of the fundamental components and benefits of PPP arrangements. For this reason, most governments in developing countries have encouraged the adoption of the popular PPP strategy to deliver affordable/low-cost housing projects for those on low incomes (Trangkanont and Charoenngam 2014), projects which governments on their own have failed to deliver. From the African country perspective, the delivery of complex infrastructure projects and the lack of capacity have been acknowledged, with PPPs identified as being among the innovative approaches used to alleviate these challenges. This has been supported by previous studies, such as the work of Luiz (2010), as one of the development challenges facing the continent of Africa. Furthermore, according to the World Bank (2016) report on Tanzania, not only can PPPs be used as a vehicle for poverty alleviation and investment, but they also allow the public sector to access the new sources of financing and benefits brought by private sector skills and management. In Tanzania, despite efforts by government agencies, a serious housing shortage is continuing as “a large number of people are inadequately housed” (Mushumbusi 2011). In addition, Tanzania’s infrastructure, in terms of its competitiveness, is worse than that of its neighbouring countries of Zambia and Uganda, and substantially worse than that of Kenya and Rwanda (World Bank 2016).

Numerous studies have been conducted on PPPs in developing countries. However, these studies, particularly from the African perspective, have largely focused on the identification of critical success factors (CSFs) and challenges or barriers to the implementation process (Osei-Kyei and Chan 2015); the identification of PPP risks (Ibrahim et al. 2006); and the reasons for the slow adoption of PPPs (Otairu et al. 2014). Some of the Tanzanian-specific studies have been very limited, focusing on investigating PPP challenges in Tanzanian municipalities (Ngowi 2006); on the successes and constraints of improving PPPs in health services delivery in Tanzania (Itika et al. 2011); and on the factors affecting joint venture (JV) formation (Minja et al. 2012). Findings on the limited successes and constraints in

improving PPPs in the study by Mboya (2013) were non-empirical, with this study more of a discussion paper in nature. The only exceptions were construction and housing-specific studies by Kavishe and An (2016) and Kavishe and Chileshe (2017). For example, in their study, Kavishe and An (2016) sought to identify the challenges faced in implementing PPPs in Tanzanian housing projects, although the study was restricted to the city of Dar es Salaam. Similarly, the study by Kavishe and Chileshe (2017) sought to identify the challenges as well as assessing the effectiveness of the National Housing Corporation (NHC)'s JV projects. According to a study by Li et al. (2005), these JVs have been identified and acknowledged as a type of PPP, as well as a medium for undertaking most PPPs in developing countries. A recent study by Akintoye and Kumaraswamy (2016) renewed the calls for more research on PPPs, identifying seven research themes that required further investigation. Despite these calls, within the Tanzanian construction and housing sectors, empirical studies are rather limited on PPPs that have explored implementation issues, CSFs (drivers), barriers and outcomes (benefits), including influencing cost and affordability factors.

Therefore, in response to the research agenda and knowledge gaps identified by Akintoye and Kumaraswamy (2016), the specific drivers of sustainability, cost and affordability factors, as well as the benefits arising from the delivery of PPPs in housing projects within the African context, need to be explored. To fill these knowledge gaps, the main objective of this study is to identify and rank the cost and affordability factors, as well as the sustainability factors that influence the delivery of HPPP projects in Tanzania. The second objective is to evaluate the advocated benefits associated with the adoption of HPPP projects. The study findings will increase practitioners' understanding of the critical cost, affordability and sustainability factors affecting the adoption of HPPP projects and their associated benefits.

#### *Conceptualisation and theoretical basis: Transaction cost theory*

As unique arrangements between two different sectors (public and private), each with its own organisational culture, goals and resources, PPPs would be expected to have both benefits and challenges, including complex financing. However, PPP transaction costs are understated (Ho and Tsui 2009). Owing to the complexity of PPP projects, their transaction costs could include advisory service costs such as legal, technical, financial, organising and negotiating costs, and monitoring and management costs (Ho and Tsui 2009). Previous studies by Akintoye et al. (2001) and Li et al. (2005) acknowledged that "high tendering costs"; "cost restraints on innovation"; "PPP complexity"; "differing or conflicting objectives among the

partners”; “high participation cost”; and “over-commercialization of projects” are among the issues that have made the PPP/private finance initiative (PFI) arrangement less appealing.

Drawing from Williamson’s (1985) transaction cost theory (TCT), it is very important to take into consideration production costs as well as the transaction cost when seeking to cut the cost of goods or services. This assists in achieving the concept of value for money (HM Treasury 2006) which is among the key PPP benefits (World Bank 2016). Hence, a low-cost production technique on its own may not signify the economical aspect (value for money) if transaction costs are ignored (Winch 2001). It was considered necessary to identify the PPP benefits, cost and affordability aspects, and sustainability factors and rank them accordingly to create more awareness and inform stakeholders about these important aspects. The three main dimensions or attributes of transaction cost theory employed in this study are those advocated by Williamson (1985), namely: (1) asset specificity; (2) uncertainty/complexity; and (3) frequency. Detailed applications and definitions of these dimensions or attributes are provided in De Schepper et al.’s (2015a, 2015b) empirical studies on public infrastructure and project delivery, as well as in Nisar’s (2013) community PPP projects.

## **Literature review**

### ***Overview of the Tanzanian context***

Within the Tanzanian context, the current housing deficit is projected as three million houses and is growing at a rate of 200,000 houses per annum (NHC 2010). The situation has been worsening in urban regions where the data show that the urban population has grown from 14.8% of the total population in 1980 to 37.5% in 2005, and was considered likely to rise to more than 46.8% by 2015 (NHC 2010). Consequently, the supply of housing in Tanzania is failing to keep up with the urban growth trend. Likewise, the 2012 census showed that the Tanzanian population has tripled since 1967 and is continuing to increase, as shown in Table 1.

**<Insert Table 1 here>**

Looking at the trends, the population growth averaged nearly 3% annually while urbanisation grew by 5% annually (Smith 2015). The findings from Table 1 further highlight the need for affordable housing. This clearly pinpoints the implication arising from the existing housing stock, providing evidence of a severe housing shortage, hence, the need for PPPs to mitigate

this deficit. In addition, the recent World Bank (2016) report on the economic outlook of Tanzania acknowledged PPPs as providing “value for money”. However, the report emphasised the “need for careful selection of the project to ensure its viability”. For example, in 2014, further to the *Public Private Partnership Act No. 18 of 2010* (the PPP Act), a Finance Unit (FU) was established within the Ministry of Finance (MoF) to assess, manage and monitor fiscal risk by assessing the affordability of projects (MoF 2014).

### ***Concept of affordability***

For the past two to three decades, the term ‘housing affordability’ has been used as a common way of portraying housing challenges in many countries (Hulchanski 1995). Both developed countries and developing countries have been experiencing housing issues at varying levels (Mushumbusi 2011). Drawing upon the definitions provided by Zillante et al. (2013), the conceptualisation of the provision of “sustainable housing” is thus perceived to be a “merit good”. This implies that a good has social merit but one that is underprovided by markets. However, the same study by Zillante et al. (2013) argued that, despite the tensions in the terminology, both affordability and sustainability, as discussed in the subsequent sections, could converge in the quest to provide merit goods.

### ***Costs and affordability***

The supply of affordable houses is still a big challenge in most developing countries in Africa, including Tanzania, where the rates of growth in population and urbanisation are continuously growing. However, the review of the literature has highlighted several cost and affordability factors that influence the implementation of PPPs in housing projects (Susilawati and Armitage 2004; Cheung et al. 2009; UN-HABITAT 2011). For example, Cheung et al. (2009) used findings from Hong Kong and Australia, comparing them with findings in the United Kingdom (UK), in investigating the 18 measures in PPPs that enhance value for money (VfM). The following were identified as the top five VfM measures: (1) efficient risk allocation; (2) output-based specification; (3) competitive tender; (4) private management skill; and (5) private sector technical innovation.

### ***Sustainability factors***

The review of the literature identified several different PPP implementation and bidding framework models each with varying numbers of stages (Thomson et al. 2009; Chan et al. 2010; Moskalyk 2011; Queiroz and Motta 2012, Trangkanont and Charoenngam 2014; Shen

et al. 2016). In Brazil, Queiroz and Motta (2012) reported that the PPP law provides for two distinct phases in the bidding process: (a) internal phase (or planning); and (b) external phase (or bidding). In addition, it is now well known worldwide that environmental sustainability is a significant issue when considering the policies and procurement of housing and urban redevelopment (Moskalyk 2011). Incorporating sustainability into PPP projects has been identified as important by the recognition and need for the public sector to display transparency (Thomson et al. 2009). The same study identified the following four key phases of sustainability assessment: (1) identification of project sustainability issues; (2) selection of assessment tools; (3) implementation of the assessment; and (4) consideration of tool outputs.

In their study, Shen et al. (2016) developed a model, labelled the sustainability performance-based evaluation model (SPbEM), which was aimed at assisting with the assessment of the sustainability performance level of PPP projects. This model was composed of 17 variables categorised into the following three groups: (1) economic, (2) social and 3) environmental. In recent years, the PPP business model has been promoted as an effective approach in developing sustainable infrastructure projects. According to Zawawi et al. (2016), the lack of competition in unsolicited proposals is a major concern in achieving sustainable procurement goals. Accordingly, their study established that introducing a competitive element to unsolicited proposals was among the practices that needed to be improved to achieve sustainability. Similarly, within the UK context, it has been suggested that successful sustainable PFI projects should integrate technical aspects into the traditional three dimensions' sustainability model and achieve a balance between social and economic performance (Zhou et al. 2013).

### ***Benefits***

The review of the literature identified several studies which reported on the benefits that could be derived from the adoption of PPPs in housing projects, both within developed countries and developing countries (Sengupta 2006; Cheung et al. 2009; Chan et al. 2010; Moskalyk 2011; Qizilbash 2011; UN-HABITAT 2011; Nisar 2013; Roehrich et al. 2014; World Bank 2016). Considered beneficial in the delivery of housing to low-income groups, PPPs have achieved success stories in different countries. For example, Moskalyk (2011) identified the following benefits of PPPs in housing: “on-time delivery”; “cost savings”; “risk sharing”; “output-based contract”; “improved level of service”; “enhancing public management”; and “increases the availability of infrastructure funds”. Another similar study

undertaken in Kolkata, India, acknowledged that PPPs bring private partners' efficiency in production, and technical and marketing expertise (Sengupta 2006). India, like Tanzania, is a developing country; therefore, the benefits, as identified, are pertinent to the current study.

Within the developing country context, Gunawansa (2012) identified the significant advantages and disadvantages of PPPs to the key parties ("host government/public-sector entity" and "investors and lenders") involved in the project. The study further attributed the advantages to the "benefiting party" and the disadvantages to the "affected party". Some of the selected advantages (benefits) that the "host government/public-sector entity" could gain were as follows: (1) training of labour and inheritance of modern technology; (2) reduction of project costs and time, while enhancing its overall efficiency and effectiveness; (3) shifting some of the project risks to the private sector; and (4) a PPP may provide greater economic benefits than other forms of public procurement methods. In contrast, only three benefits were attributable to "investors and lenders" as follows: (1) access to new and previously restricted markets and sources of new profit; (2) minimising political risk and better allocation of risks; and (3) availability of tax or other investment incentives. Similarly, within the context of sub-Saharan Africa, Qizilbash (2011, p. 29) identified the benefits of PPPs as including the ability to tap into experience in operational, technological and managerial expertise from the private sector; and the opportunity to modernise existing operations, share costs and achieve economies of scale. Furthermore, Nisar's (2013) study used three community projects to highlight the benefits that private companies bring to partnerships as including innovative design, project management skills and risk management expertise. The World Bank (2016) report identified the following benefits: (i) delivering projects on time and within budget more than is the case for public projects; (ii) higher level of service quality and efficiency gains; (iii) value for money (VfM) and affordability; and (iv) substantial technical, operational and financial risk transfer to the third party. Furthermore, the report provided evidence of where these PPPs have reaped benefits in countries such as Kenya, South Africa, India, Mexico, Chile and Brazil. It is worth noting that some of these identified countries are from the country groupings known as CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa) and BRICS (Brazil, Russia, India, China and South Africa) which are regarded as emerging economies.



## **Research methodology**

In this study, the research approach consisted of the following four steps: (1) literature review; (2) pilot survey; (3) questionnaire survey; and (4) statistical analysis. The rationale for this approach was to enhance the validity and, furthermore, to provide the opportunity to increase the reliability of the research (Easterbrook et al. 2008).

### ***Measurement instrument***

The questionnaire comprised three distinct sections as follows: (1) demographics; (2) issues on affordable housing; and (3) sustainability drivers, and cost and affordability factors and benefits. In the current study, the detailed justifications for the sampling and data collection methods employed were similar to those of Kavishe and An (2016). Therefore, while acknowledging that the purpose of this study was descriptive, the overarching ‘research ethos’ is not reported here. A similar approach of not replicating the detailed research methodology when the study shares a common population and has been reported previously has been adopted by other researchers, such as Kunhui et al. (2013) and Chileshe and Kikwasi (2014a).

### ***Survey administration***

To collect the required and relevant information, purposive sampling was the approach used amongst the targeted population, namely, the stakeholders involved in housing PPP (HPPP) projects in Dar es Salaam, Tanzania. This ‘non-probability’ sampling was employed due to the researcher’s knowledge about specific Tanzanian cases (Rowley 2014). Unfortunately, no official list or standard database specifying the number of stakeholders’ organisations involved in HPPP projects within the study area was available. Only two public organisations, including their list of projects (183 NHC projects and one National Social Security Fund [NSSF] project), 60% of which were based in the study area, and their private partners and consultants were identified. Of the 38 questionnaires administered to the targeted population, 28 questionnaires were considered valid. The response rate, which is equivalent to 78%, was well above similar studies in PPP survey-related research. In addition, as observed by Coviello and Jones (2004, p. 494), if high-quality survey data are obtainable from a smaller sample drawn using well-developed selection criteria, meaningful findings can still result. Focusing on the selection criteria, such as stakeholders with prior expertise in housing PPP (HPPP) projects, was deemed sufficient for mitigating the small sample size, as employed in the current study.

## ***Data analysis***

Quantitative data were analysed using the IBM SPSS Statistics (SPSS) computer programme version 22.0. The SPSS procedure comprised the following two methods or techniques: (i) parametric tests, that is, one-sample *t*-tests; and (ii) descriptive statistics tests using measures of central tendencies and frequency analysis (Forza 2002; de Winter 2013). For example, despite having a small sample size of 28 respondents, the one sample *t*-test was still employed in line with de Winter (2013) who noted that no minimum sample size is required for the *t*-test to be valid. Validity requires that the assumptions for the test statistic hold approximately. The ranking of the variables or factors was based on frequency analysis undertaken using the values generated from the central tendencies, such as the standard deviation and mean scores. The following subsections present a brief discussion of each approach:

***Frequency analysis:*** Frequency analysis enabled the ranking of the cost, affordability and sustainability factors that influenced the delivery of HPPP projects in Tanzania, as well as the evaluation of the benefits. This analysis was based on the mean score generated from SPSS's descriptive statistics techniques. This approach has been used in PPP-related studies in developing countries such as Nigeria (Ibrahim et al. 2006) and Malaysia (Ismail and Harris 2014). Where factors and benefits had the same score, rank differentiation was used by assigning the higher ranking to the factor with a lower standard deviation. As opined by Forza (2002), the standard deviation, generated by the descriptive statistics, provides the variability that exists in the information for the ease of comprehending that information. In order to effectively communicate the benefits of the PPP outcomes, indices were generated.

Drawing upon a previous study on risk management within the Tanzanian context (Chileshe and Kikwasi 2014a), classifications based on the quantitative data from the respondents' perceptions of the benefits were computed and translated into qualitative categories of low, medium and high. Any benefit with mean values  $\geq 3$ , or a relative agreement index (RAI) value greater than 0.6 (see Table 2), was classified as significant or as having above medium effects.

**<Insert Table 2 here>**

***One-sample t-test of the mean:*** A one (single)-sample *t*-test of the mean was undertaken to measure the significance of the cost and affordability factors and of the sustainability drivers

(factors) influencing the delivery of HPPPs and their associated outcomes in the form of benefits. Rather than simply taking mean values above 3.0 as important or critical, the authors deemed it appropriate to conduct statistical tests, for example, a *t*-test to find out if the mean values are significantly different from 3.0 or even 3.5 (which approximates to 4.0, in other words, to agree on the 5-point scale). This approach has been used in previous studies, for instance, those by Ochieng and Chileshe (2016) and Ling and Nguyen (2013). For example, drawing upon Ling and Nguyen's (2013) study, the cut-off point for a 5-point scale was set at "3.5" ( $\mu = 3.5$ ): using the procedures outlined in Cronk (2012), the analysis for the one-sample *t*-test was conducted. The formulated hypothesis was used to measure the extent of the identified factors (cost and affordability, and sustainability) and the benefits associated with HPPP delivery. The study by Ling and Nguyen (2013) used a 7-point scale to measure strategies for waste management practices, and provided justification for its selection of "5" as the cut-off point for comparison. The current study applies the same logic. By inference, the value of "3" would be the middle point for the identified variables that influence HPPP delivery. Furthermore, this would be equivalent to 50% of implementation. However, given the importance and the lack of HPPP implementation within the Tanzanian context, a value higher than 50% of the delivery and implementation effort is appropriate. To that end, the  $\mu$  value is set at 3.5. Thus, the rationale and explanation of the null hypothesis are that the above-mentioned HPPP factors and benefits associated with project delivery have a significant effect, whereas the alternative hypothesis is that the variables under consideration are not significant and are less important.

### ***Characteristics of the survey respondents***

The characteristics of the survey respondents and their organisations are summarised in Tables 3 and 4 respectively.

**<Insert Table 3 here>**

Examinations of Table 3 show that with regards to Professional background, a fair proportion 5(17.9%) were quantity surveyors. There was a fair distribution of varying professions amongst the remainder of the survey respondents. For example, there was an equal number of the minority 1 (3.6%) being a lawyer, Sales Supervisor, and Assistant Director. The inclusion of the Lawyer was particularly significant given the different forms of HPPP and the legal implications of the JV in Tanzania. More so, according to the Ministry of Foreign Affairs of

the Netherlands (2013) IOB study, in developing countries, most PPP contracts are JVs and management contracts. Therefore, the need for opinions from a knowledgeable respondent [such as a Lawyer] around the checking the credentials of the other party during the selection process within the JV process was necessary. Based on the reported demographic background (individual characteristics) of the respondents (see Table 3), it can thus be demonstrated that all key actors in PPP housing projects as well as varying management levels were involved in the survey thus enhance the reliability and validity of the findings.

***Length of service in current position:*** The results revealed that the respondent's period of experience (employment in current position) in the Tanzanian construction housing sector was evenly spread across the spectrum: Less than 5 years, 5–10 years and 11–15 years (Table 3). The majority of the respondents 8 (28.6%) fell within the 'less than 5' and '11–15' years categories.

#### ***Organisational characteristics***

The organisational characteristics of the profile of respondents are illustrated in Table 4.

**<Insert Table 4 here>**

***Designation (sector) of respondents:*** Examination of Table 4 shows that the majority 11(39.3 %) of the respondents were from the public sector. This was followed by 9 (32.2%) consultants. This finding is hardly surprising as the National Housing Cooperation (NHC) and National Social Security Fund (NSSF) are the only two public sectors in Tanzania which have adopted PPP as an alternative housing delivery strategy. While they are the only 2 public sectors in HPPP in Tanzania, the unit of analysis of this study was based on the respondents working for the organisations and not the actual public sector organisations.

***Type (sector) of PPP projects involved:*** The majority 22 (81.5%) of the PPP projects that the organisations had been involved with were drawn from the housing sector within the last 5-10 years.

***No. of PPP housing projects involved (Experience):*** In terms of the involvement (experience) with PPP housing projects, overall 60.71% of the respondents had been involved in more than two PPP housing projects. The majority of the respondents 7 (25.00%) fell within the 'less than 2' and 'over 10 projects categories. This finding suggests that despite PPP being in its early stages primarily due to the lack of direct experience and inadequate

new investment in housing projects, there is a growing trend to the usage of PPP as evidenced by some of the respondents having extensive experience with managing these projects.

## **Survey results**

### ***Reliability analysis***

The reliability and internal consistency of the survey sub-instruments was tested by using Cronbach's alpha coefficient to examine and assess the adequacy of the measurement instrument. Recent PPP-related studies, such as Hashim et al. (2016), have used similar approaches for the reliability analysis. With the exception of the 'benefits' sub-instrument which had the Cronbach alpha value of 0.572 ( $F$ -statistic = 6.907, sig. = 0.000), the values for 'cost and affordability factors' and 'sustainability factors' sub instruments had Cronbach Alpha values of 0.103 and 0.300 and  $F$ -statistics of 2.791 and 6.270 respectively. These considered as very low and less than the required threshold. While the Cronbach alpha ( $\alpha$ ) coefficient for these sub instruments was less than the required threshold of 0.7, thus indicating a low reliability of scales (Nunnally 1978), although Nunnally has pointed out that lower thresholds are sometimes used in the literature. More so, some studies such as Tavakol and Dennick (2011) have pointed out that a high coefficient of alpha does not always mean a high degree of internal consistency. Furthermore, investigation of the 'item-total statistics' and 'Alpha if item deleted' revealed that only the deletion of the least ranked item, namely '*Reduction of whole life costs of a project*' would improve the reliability to 0.617. However, due to negligible impact on the Cronbach alpha values and, the importance attached to '*Reduction of whole life costs of a project*' this item was not deleted, but included in the overall survey instrument. However, examination of the item-total statistics revealed that the reliability of the instruments could not be improved any further with the deletion of the items (Cronk 2012). Despite the low reliability of scales, the seminal study by Nunnally (1978), has pointed out that lower thresholds are sometimes used in the literature.

### ***Ranking of the cost and affordability factors influencing the delivery of HPPP***

Using a five point Likert scale as described in the research methodology section, the practitioners were requested to rate the importance of five costs and affordability factors influencing the delivery of HPPPs projects. The results of the practitioners' perceptions are shown in Table 5.

**<Insert Table 5 here>**

The *t*-tests of the means show that two of five of the factors were significant in influencing the delivery of HPPPs projects. The results further shows that the mean agreement scores of the five factors ranged from 3.64 (PPP procurement is economical compared to traditional procurement) to 2.966 (most PPP implementing bodies are capable to afford the project transaction costs). In contrast, the standard deviation of all the factors ranges from 0.989 to 1.353, the highest standard deviation being the highest ranked cost and affordability factor, namely "PPP procurement is economical to traditional procurement". Table 5 also shows that more than half 3 (60.0%) of the factors influencing the implementation of PPP housing projects are not statistically significantly different (Test 2: mean > 3.5, *t* value positive, *p* > 0.05) as delivered in Tanzania. However, despite the higher ranking of these three factors, the results were contradictory to a number of studies such as Moskalyk (2011), Sengupta (2006), and Ibem and Aduwo (2012). One plausible explanation for this contradiction could be due to the fact that the selection of partners done by the NHC HPPP projects in Tanzania was non-competitive in the first place and was on the first come first served basis as discussed in Kavishe and An (2016) study. Additionally the procurement of HPPP project did not involve the use of any advisory service such as legal, economic, financial, organising and management (Ho and Tsui 2009), thus not having any cost implications towards the transaction process.

Interesting these were the highly ranked three factors. In contrast, when the *t* test that compared the mean population value of 3.500 was conducted, a significant difference (Test 1: mean < 3.5, *t* value negative, *p* < 0.05) was found for the two least ranked factors as follows: 'Most PPP implementing bodies are capable to afford project transaction costs' (*t* (27) = -2.566, *p* = .016 < 0.05) with a mean difference of -.53571; and "High PPP costs are a major setback for more PPP projects in Tanzania ", (*t* (27) = -2.514, *p* = .018 < 0.05) with a mean difference of -.64286. The inability of the Tanzanian stakeholders in affording transaction costs is further supported by Arrow (1969, cited in Williamson 1985) who defined these transaction costs as the "costs of running the economic system". Drawing from Williamson's

(1985) transaction cost theory (TCT), to cut down the cost of goods or services, it is very important to take into consideration of both production costs and transaction cost. Developing countries, particularly African states like Tanzania have difficulties in managing their economic systems. For ease of discussion, only the top three ranked cost and affordability factors (mean score > 3.50) as based on the degrees of central tendency are discussed in detailed here.

### ***PPP procurement is economical compared to traditional procurement***

Based on the mean score, “PPP procurement is economical compared to traditional procurement” was the highest ranked ‘cost and affordability’ factor (mean = 3.643) and not statistically significant ( $t(27) = 0.764, p = .451 > 0.05$ ) with a mean difference of .1429. This finding is also consistent with PPP literature regarding comparative benefits between PPP and tradition procurement (Hoppe et al. 2013; Roehrich et al. 2014; Chan et al. 2009). For instance, the study by Hoppe et al. (2013) identified provision of stronger incentives to make cost-reducing investments among the benefits of PPP when compared to traditional procurement. More so, from the performance evaluation perspective, the same study established that, similar to traditional procurement, *ex post* evaluation is being widely used in PPP projects. However, it appears that when economics is the motivating factor for PPP adoption, the results drawn might be different. Hence drawing from Ping Ho (2015) the Transaction Cost theory may enhance the existing practice in evaluating PPP feasibility and managing PPP projects. Similarly, as asserted by Tang et al (2010), PPP experiences cannot simply be copied from one country to another since different countries have different practices in terms of culture and policy.

### ***PPP brings about value for money in housing delivery projects in Tanzania***

“PPP brings about value for money in housing delivery projects in Tanzania” was the second ranked cost and affordability factor (mean = 3.536) and not statistically significant ( $t(27) = 0.171, p = .865 > 0.05$ ) with a mean difference of .0357. This finding is also consistent with PPP related studies within the developed and developing economies (World Bank 2016; Cheung et al. 2009). More so, this factor is similar to one of the benefits (see Table 7) and could thus be used interchangeably as an influencing factor in form of ‘cost and affordability’

as well as the ‘*benefit*’ arising from the adoption of the PPPs. Similarly, the World Bank (2016, p. 26) report highlighted the need of selecting partners through a competitive process to ensure that the Government received the best price (VfM). This implies that the Tanzanian practitioners would benefit from VfM drivers (measures) such as ‘Private management skills’ and ‘Competitive tender’ (Cheung et al. 2009). Given the high proportion of Tanzanian PPP projects that have been subjected to early termination compared to the global average (World Bank 2016, p. 44), the identified benefit of “Private management skills” could go a long way in assisting the Tanzanian public sectors in carrying out their distinctive roles of identifying projects and monitoring and evaluation (Mboya 2013).

### ***PPP can facilitate the supply of affordable housing outcome in Tanzania***

“PPP can facilitate the supply of affordable housing outcome in Tanzania” (mean = 3.500)’, and not statistically significant ( $t(27) = 0.000, p = 1.000 > 0.05$ ) with a mean difference of -.0000 was the third ranked cost and affordability factor. Support of this factor is also consistent with the findings in literature review (Ukoje and Kanu 2014). In Nigeria, PPP were employed by the government in Abuja, which is the capital city, as a means of providing affordable housing for citizens of Abuja. In Tanzania’s former capital city of Dar es Salaam, and the main focus of this study, has a land area of 1,350 km<sup>2</sup> s, holds 10% of the country’s population while 70% of its residents live in informal settlements (Kidata 2013). Therefore, PPPs could be used a vehicle for reducing the shortage of residential plots in Peri-urban Dar es Salaam as well as the informal settlements. However, this study acknowledges that the attainment of this benefit is conditional upon resolving any substantial governance and pricing problems and transaction inefficiencies or costs as argued in Ping Ho et al.’s (2015) study.

The above results should nevertheless take into consideration, the prevailing conditions and regulations of the host country. For example, earlier studies such as Susilawati and Armitage (2004) conducted in Queensland, Australia; found that, PPPs may not facilitate increasing the supply of affordable housing without major guideline changes.

### ***Ranking of the sustainability factors influencing the delivery of HPPP***

The practitioners were also asked to rank the sustainability factors influencing the delivery of HPPP projects. The results are summarised in Table 6. Prior to undertaking these *t*-tests, although not reported here, the normality of the data was undertaken through the examination



of the descriptive statistics such as the skewness and kurtosis. No assumptions were found to be violated

<Insert Table 6 here>

The mean agreement scores of the five sustainability factors ranged from 3.889 “Sustainability assessment always starts from the feasibility stage” to 2.714 “Sustainability is not highly important in PPP projects in Tanzania”. In contrast, the standard deviation of all the factors ranged from 0.678 to 1.150. Interestingly, the highest standard deviation being the third ranked sustainability factor, namely “There is no evaluation mechanism framework used for sustainability assessment”. However, the lower standard deviation, with the exception of the lowest ranked factor suggests that there was broad consensus of opinion regarding the importance of these sustainability factors amongst the respondents.

Table 6 shows more than half (60.0%) of the sustainability influencing the implementation of PPP are not statistically significantly different (Test 2: mean >3.5, t value positive,  $p > 0.05$ ) as delivered in Tanzania. For ease of discussion, and enhance the better understanding of the implications, all of the five sustainability factors are included in the discussions here. It is also noted that there was a statistically significant difference ( $p < 0.05$ ) between the opinions in the perception for the remaining (40%) of the sustainability factors, which evidently were also the two least ranked factors. This finding is further supported by their attainment of mean score values of less than 3.0. The following subsections now present a brief discussion of the five cost and affordability factors.

### ***Sustainability assessment always starts from the feasibility stage***

The analysis revealed that the practitioners recognised “Sustainability assessment always starts from the feasibility stage” as the most important sustainability factor (mean = 3.889) and not statistically significant ( $t(27) = 593$ ,  $p = 0.558 > 0.05$ ) with a mean difference of 0.1071. This finding implies that prior to undertaking the PPPs, the Tanzanian practitioners were supposed to carry out the sustainability assessment during the feasibility stage if the delivery of the PPP housing projects were to be successful. For example, within the context Asian emerging economies, it is well established that *project* outcomes can be improved through the inclusion of environmental sustainability, among other factors (Atmo and Duffield 2014). Similarly, within the Indian context, recent studies such as Patil and Laishram (2016) highlighted the need of undertaking environment impact assessment within

the PPP procurement process. Accordingly, this approach would lead to enhancement of the procurement process. It is worth noting that the sustainability assessment encompasses the three dimensions of social, economic and environmental.

***Sustainability factors are always considered when evaluating project viability.***

“Sustainability factors are always considered when evaluating project viability” was ranked second (mean = 3.714) and not statistically significant ( $t(27) = 1.400, p = 0.173 > 0.05$ ) with a mean difference of 0.2143. This implies that despite the PPPs adoption being in its infancy in Tanzania, the practitioners are beginning to acknowledge the importance of undertaking the crucial economic, social and environmental assessment of the project. As indicated in literature and existing PPP models and frameworks, this process is undertaken to allow a proposed PPP project to go through screening and checks in order to further ascertain its viability, affordability, value for money and appropriate risk transfer (Trangkanont and Charoenngam 2014; Chan et al. 2010). For example, project technical feasibility has been identified as being among the important consideration when considering PPP procurement options (Chan et al. 2010). This finding implies that, in spite of the challenges and infancy of the PPP implementation, the Tanzanian practitioners were nevertheless cognisant of some good PPP implementation practices.

***There is no evaluation mechanism framework used for sustainability assessment.***

“There is no evaluation mechanism used for sustainability assessment” ranked the third (mean = 3.357). Despite this ranking, the lower value of the standard deviation ( $SD = 0.678$ ) and not statistically significant ( $t(27) = -1.114, p = 0.275 > 0.05$ ) with a mean difference of -0.1429. This result further reinforces the consensus amongst the respondents with regards to the importance of this sustainability factor. However, this finding implies that there lacks appropriate mechanisms and checks and balances among the Tanzanian practitioners for the effective delivery of the PPP projects. This finding is of concern given the importance and need of robust PPP project evaluation and performance measurement frameworks (Akintoye and Kumaraswamy 2016). For instance, the study suggested the need for more robust performance measurement and project evaluation within the context of PPPs.

***Sustainability assessment always starts at the procurement stage***

“Sustainability assessment always starts at the procurement stage” ranked the fourth (mean = 3.000). Despite achieving this lower ranking, there was a significant difference (Test 1: mean

$< 3.5$ ,  $t$  value negative,  $p < 0.05$ ) for this factor ( $t(27) = -2.806$ ,  $p = .009 < 0.05$ ) with a mean difference of  $-.5000$ . This finding implies that the Tanzanian practitioners must pay more attention in undertaking the sustainability assessment during this procurement stage. In their role as the *Gatekeeper* for the procurement process, the PPP FU in Tanzania must ensure that the proposals as submitted by the stakeholders are subjected to stringent tests of value for money as well as sustainability (Mboya 2013). Failure to undertake this process would affect the competitive nature of the process. As observed by Zawawi et al. (2016) within the Malaysian context, “Lack of competition in procurement processes may affect the sustainable procurement due to overpriced and low-quality infrastructure”. The World Bank (2016, p. xiv) further lends support to this assertion by stating that “Competition brings the best out of private investors and helps to ensure that the Government achieves value for money”.

### ***Sustainability is not highly important in PPP projects in Tanzania***

The least ranked factor was “Sustainability is not highly important in PPP projects in Tanzania” (mean = 2.714). However, despite the low ranking, the result as evidenced by the ‘disagreement’ of the statement by the respondents rather confirmed the importance attached to the integration of the concepts of sustainability principles in PPP procurement process (Patil and Laishram 2016). Furthermore, when the  $t$  test that compared the mean population value of 3.500 was conducted, a significant difference (Test 1: mean  $< 3.5$ ,  $t$  value negative,  $p < 0.05$ ) was also found for the fifth and least ranked factors as follows: ‘Sustainability is not highly important in PPP projects in Tanzania’ ( $t(27) = -3.615$ ,  $p = .001 < 0.05$ ) with a mean difference of  $-.78571$ . This finding is rather encouraging for the Tanzanian practitioners and alleviates the observation by the World Bank (2016) report regarding poor project design arising from the failure to undertake feasibility analysis for PPP projects. One plausible explanation for lack importance attached to this factor could be attributed to the lack of expertise and experience among the Tanzanian administering organisations (see Table 4). For example, a study by Moskalyk (2011) argues that in majority of countries the PPPs responsibilities are vested within the ministry of finance or other ministry departments who are less aware of environmental issues, thus failing to integrate sustainability principles into their PPP project assessment, preparation and execution process. This scenario is similar in Tanzania where the PPP Unit and PPP Coordinating units are responsible for overseeing this task are located within the Ministry of Finance (Mboya 2013; World Bank 2016).

### ***Ranking of the benefits from adoption of PPP housing projects in Tanzania***

Table 7 summarises the results on the relative importance of the benefits surrounding the delivery of HPPPs projects.

**<Insert Table 7 here>**

The analysis of the survey response data shows that the mean agreement scores of the 6 benefits ranged from 4.423 (Encourages private sector innovation and management skills) to 3.385 “Reduction of whole life costs of a project”. With the exception of the least ranked “Reduction of whole life costs of a project”, the remaining five benefits achieved a mean score > 3.50 with their standard deviation very low and ranging from 0.5778 to 1.209.

#### ***Encourage private sector innovation and management skills***

Based on the mean scores, “Encouraging private sector innovation” was the highest ranked benefit (mean = 4.423). In comparison of the mean value of this benefit with a population value (test value) of 3.500, a significant difference was found ( $t(26) = 8.146, p = .000 < 0.05$ ) with a mean difference of 0.9231. This result is also consistent with PPP literature regarding the associated benefits (World Bank 2016; Hodge 2004; Chan 2008; Cheung et al. 2009; Nisar 2013; Roehrich et al. 2014). For example, Hodge (2004) found that ‘accessing rare skills’ as one of the outcomes of PPP. The higher ranking of this benefit is hardly surprising given the prevailing challenges such as training in Tanzania. For example, Chileshe and Kikwasi (2014b) study established that only the Tanzanian professionals working for foreign contractors (i.e. through JVs) have the ability of getting training. These findings are also consistent with earlier literature on PPP training skills (Debrah and Ofori 2006). In other sectors such health, Roehrich et al. (2014) also suggested that the PPP benefits could emanate from combining the strengths of private actors such as innovation, technical knowledge and skills, and managerial efficiency amongst others. However, this benefit also extends to developing economies. For example, Cheung et al. (2009) identified ‘Private management skill’ and ‘private sector technical innovation’ among the key VfM drivers for the delivery of Australian and Hong Kong PPP projects.

#### ***Possibility of risk sharing between parties***

According to Jin and Doloi (2008, cited in Osei-Kyei and Chan 2015, p. 142), allocating and sharing risk has always been one of the fundamental components of PPP arrangements. This assertion is further reinforced as the “Possibility of risk sharing between parties” was the second ranked benefit associated with the adoption of housing public-private partnership

projects in Tanzania (mean = 4.370) and statistically significant ( $t(27) = 6.099, p = .000 < 0.05$ ) with a mean difference of .08704. The support of this benefit is very evident across a number of disciplines and different sectors (Cheung et al. 2009; Tang et al. 2010; Osei-Kyei and Chan 2015; Akintoye and Kumaraswamy 2016; Hashim et al. 2016). For example, Cheung et al. (2009) identified 'Efficient risk allocation' among the key VfM drivers for the delivery of PPP projects. In addition, the private sectors are able to bring commercial decisions into public projects (Tang et al. 2010, p. 685). However, these findings should be treated with caution as Roehrich et al.'s (2014) study within the health sector suggested that notions such as VfM and risk transfer are regularly conflated. This finding implies that, for this benefit of risk-sharing between the public and private participants to be actually achieved, according to Nisar (2007, cited in Hashim et al. 2016), there needs some conditions in place such as agreeing on a project to be developed through PPP scheme. Finally, as advocated by a number of studies within the Tanzanian context (Chileshe and Kikwasi 2014a, 2014b) and developing countries in general (Debrah and Ofori 2006), the recourse or pathway to enhanced training is through encouraging the Tanzanian stakeholders (particularly contractors) to collaborate with foreign contractors on projects through JVs.

### ***PPP provides value for money***

As expected, "PPP provides value for money (VfM)" was ranked high amongst the benefits associated with HPPPs projects in Tanzania; it was ranked third (mean = 3.963) and statistically significant ( $t(27) = 2.679, p = .013 < 0.05$ ) with a mean difference of .04629. The linkages between the improvement of project outcomes and considerations of the benefits from VfM are well established in literature. For example, Atmo and Duffield's (2014) study of Asian emerging economies advocated for the assessment of PPP using a VfM framework for assessment of PPP as a pathway for highlighting the benefits. Similarly the World Bank report (2016), using Kenya as an example demonstrated where PPP provided VfM. Kenya shares similar economic and geographical characteristics with Tanzania. However, the same report stated that this was conditional upon having appropriate regulatory frameworks. Additionally it is noted that in the UK as well as other countries VfM approach has been considered as one of the key criteria involved in deciding whether a project should be procured under PPP method or traditional method (Tsamboulas et al. 2013).

### ***Encourages delivery on time***

“Encourages delivery on time” was the fourth ranked benefit (mean = 3.962) and statistically significant ( $t(27) = 2.702, p = .012 < 0.05$ ) with a mean difference of .04615. This survey finding is also consistent with PPP literature regarding the associated benefits of ‘completion on time’ (World Bank 2016; Abdul-Aziz and Kasim 2011; UN-HABITAT 2011; Sengupta 2006). For example, within the Malaysian context, (Abdul-Aziz and Kasim 2011) identified ‘on-time completion’ among the highly ranked objectives of housing PPP, whereas in a study conducted by Sengupta (2006) within the Indian context, the case study of housing projects in Kolkata had been successful in adopting PPP in housing in terms of cost and quality. Both Malaysia and India share similar economical characteristics as developing countries. Furthermore, according to the UN-HABITAT (2011, p. 4), the ability of the private sector to have a direct financial interest ensures that projects and services are delivered on-time, if not sooner

***Acceleration of affordable housing provision and improved quality of services and Reduction of whole life costs of a project***

“Acceleration of affordable housing provision and improved quality of services” (mean = 3.667) and “Reduction of whole life costs of a project” (mean = 3.385) were the least ranked benefits with medium levels and not statistically significant ( $t(27) = 0.716, p = .480 > 0.05$ ) with a mean differences of .01667 and ( $t(26) = -0.625, p = 0.538 > 0.05$ ) with a mean difference of -.1154, respectively. Despite the lower ranking and not significant, these benefits are consistent with the findings in literature review (Tang et al. 2010; World Bank 2016). For example, according to Andres et al. (2013, cited in World Bank 2016), the participation of the private sector had a significant impact on the quality of service delivery. Similarly, while the recent studies, such as El-Haram et al. (2010), have highlighted the importance of ‘whole life costs of a project’, the probable lower ranking of this benefit could be attributed to the lack of reliable and consistent data on elements of whole life cost (capital, facilities management, and disposal) and the performance of building elements and services as suggested by El-Haram et al. (2010). There is also the issue of the risks associated with ‘lack of cost control’ during the land acquisition, design and construction during the project development phase as observed in Thailand specific studies such as Trangkanont and Charoenngam (2014).

***Overall ranking of the benefits***

Table 7 shows that the overall average weighted benefits score was 3.962 which imply that, despite the PPPs being in their infancy, the Tanzanian housing and construction practitioners perceived the advocated benefits from adoption of PPPs to be of medium levels (see Table 3). This finding further reinforces the suggestion by Akintoye and Kumaraswamy (2016, p. 23) regarding the need for developing a communications strategy that demonstrates the benefits achieved from PPP projects. This mechanism would encourage the uptake of HPPP projects.

## **Conclusions, Implications and Recommendations**

Prior evidence on the drivers of sustainability, cost and affordability as well as the benefits arising from adoption of PPP are very scant in majority of Sub-Saharan African countries. This scoping empirical study is to the best of our knowledge, among the first that identifies and ranks the cost and affordability, sustainability factors influencing the delivery of the HPPP projects in Tanzania, as well as evaluating the benefits. The study has investigated the perception of the Tanzanian housing practitioners on the influencing factors (cost and affordability, sustainability) and outcomes (benefits) associated with the delivery of the HPPP projects in Tanzania. The top three 'cost and affordability factors' were: (1) PPP procurement is economical compared to traditional procurement; (2) PPP brings about value for money in housing delivery projects in Tanzania; and (3) PPP can facilitate the supply of affordable housing outcome in Tanzania. The results demonstrated that the Tanzanian practitioners ranked the following four sustainability factors as influencing the delivery of PPP housing projects: (1) Sustainability assessment always starts from the feasibility stage; (2) Sustainability factors are always considered when evaluating project viability; (3) There is no evaluation mechanism framework for sustainability assessment; and (4) Sustainability is (not) highly important in PPP projects in Tanzania. Finally, from Table 7, the highly ranked four benefits were as follows: (1) Encourage private sector innovation and management skills; (2) Possibility of risk sharing between parties; (3) PPP provides value for money; and (4) Encourages delivery on time. These are among the boundaries and success factors needed to make PPP effective for housing project in developing countries following a detail evaluation. What is needed is approach/framework that allows these aspects to be captured.

Some implications for *practice*, *researchers (academia)* and *policy makers* are suggested as follows:

- For *policy makers*, the ranking and identification of sustainability factors (Table 6) would enable the stakeholders such as the Government of Tanzania and its agencies to formulate better PPP policy and regulatory framework and strategies. Furthermore, a better understanding of these factors will improve the delivery of HPPPs through better informed practice thus bridging the gap between the growing demand and the supply. For example, due consideration would be provided for integrating sustainability activities within the PPP processes. In so doing, the assessment of PPP projects by the Tanzanian practitioners would be enhanced, thus enabling genuine and correct decisions to be made (Mboya 2013).
- For *researchers (academia)*, this study provides further avenues for investigating and exploring the impact of the organisational control variables (see Table 4) such as type of housing projects and number of PPP housing projects (experience) on the cost and affordability factors (Table 5) and sustainability factors (Table 6) on the emergent benefits (Table 7). Furthermore, the findings contribute to the responses to the PPP research agenda as advocated by Akintoye and Kumaraswamy (2016) regarding the need for developing a communications strategy that demonstrates the benefits of PPPs.
- For *practitioners*, the knowledge and awareness arising from the proposed scoring of the benefits associated with PPPs (see Table 7), yet the parsimony approach enabled the identification of the pictorial status of the current overall 'medium' benefits of PPPs in Tanzania. More so, this could lead to increased awareness to enable successful delivery of HPPP in Tanzania.

While a number of contributions to PPP theory and practice emerge, this study applied transaction cost theory to offer some insights into understanding the viability and how cost and affordability, sustainability factors and benefits influenced the delivery of HPPP projects. TCT was interpreted; PPP project should deliver value for money. According to Ho and Tsui (2009) value for money can be achieved only if transaction costs are effectively controlled.

Besides the contributions made, the findings of this study should be interpreted in light of the following limitations related to the geographical setting, sample size, and cross section nature. Firstly, the survey sample consisted of stakeholders drawn from only one city in Tanzania, namely Dar-es-Salaam, and consequently the results may not be generalised to



other surrounding countries sharing similar economic conditions. Secondly, although the sample of this study (n=28) was limited the scoping nature, the findings represent a snapshot of the influencing factors for the delivery of HPPP. However, this limited the exploration of synergies between the influencing factors and outcomes (benefits). More so, as suggested by de Winter (2013, p. 8), despite the small sample, the results as obtained can be deemed as credible as long as they are supported with existing evidence in the research field, which our study has attempted to follow. Thirdly, this study relied on the usage of self-report data and indicators of the construct are sensitive and difficult for respondents. However, the findings provide some valuable insights into some aspects of PPPs, an area previously under researched. Future studies employing larger quantitative samples would further explore the issues as reported. Secondly, in light of the reported low Cronbach's alpha values, future studies could consider the additional of items for the related instruments as a mechanism for increasing the alpha values (Tavakol and Dennick 2011).

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**Table 2.** Scoring the levels of the benefits of adopting housing public-private partnership (HPPP) projects in Tanzania

Average Score ( $\sum_{a=1}^5 W_i / N$ )	RAI	Benefits Level
4.0 to 5.0	0.8 to 1.0	High (H)
3.0 to < 4.0	0.6 to < 0.8	Medium (M)
1.0 to < 3.0	0.20 to < 0.6	Low (L)

**Source:** Adapted from Chileshe and Kikwasi (2014a)

RAI = Relative agreement index



**Table 3:** Profile of study sample – Individual characteristics

Individual characteristics	Frequency	Percentage (%)
<i>Professional background</i>		
Quantity surveyor	5	17.86
Engineer	4	14.29
Land valuation agent <sup>1</sup>	3	10.71
Architect	3	10.71
Lawyer	1	3.57
Other professional roles*	12	42.86
<i>Length of service in current position (years)</i>		
Less than 5 years	8	28.57
5-10	7	25.00
11-15	8	28.57
More than 15	5	17.86

**Notes:** <sup>1</sup>The profession of land valuation agent used interchangeably with 'Land valour'. \*The breakdown of the 'other' professional roles were as follows: Managers (2); Staff (3); Consultant (2); Sales supervisor; Assistant director; Principal consultant; Advisor; and Director;.

**Table 4:** Profile of study sample – Organisational characteristics

Organisational characteristics	Frequency	Percentage (%)
<i>Designation</i>		
Consultant	9	32.15
Private developer	2	7.14
Public partner	11	39.29
Contractor	1	3.57
Financer	1	3.57
Researcher (Academic) <sup>1</sup>	2	7.14
PPP advisor <sup>1</sup>	2	7.14
<i>Type (sector) of housing projects</i>		
Transportation	2	7.4
Housing	22	81.5
Others	3	11.1
<i>No. of PPP housing projects involved</i>		
Less than 1	4	14.29
1 - 2	7	25.00
3 - 5	4	14.29
6 - 10	6	21.42
Over 10	7	25.00

**Notes:** <sup>1</sup>These designations (Researcher and PPP advisor) were specified by the respondents as they were not part of the options given within the survey questionnaire; \*The limited number of transportation PPP projects is indicative of the recent calls by the MOF in 2014 to explore mechanisms for review of Transport sector potential PPP transactions.

**Table 5:** Ranking of cost and affordability factors influencing HPPPs projects and *t*-tests.

Cost and affordability	T-test ( $\mu = 3.5$ )	df	Sig (2-tailed)	MS <sup>1,2</sup>	Std. Dev	R	Significant ( $p < 0.05$ )
PPP procurement is <b>economical</b> compared to traditional procurement	0.764	27	0.451	3.643	0.989	1	No
PPP brings about <b>value for money</b> in housing delivery projects in Tanzania	0.171	27	0.865	3.536	1.105	2	No
PPP can facilitate the <b>supply of affordable housing outcome</b> in Tanzania	0.000	27	1.000	3.500	1.202	3	No
Most PPP implementing bodies are capable to afford the <b>project transaction costs</b>	-2.566	27	<b>0.016*</b>	2.964	1.105	4	Yes
High PPP <b>costs are a major setback</b> for more PPP projects in Tanzania	-2.514	27	<b>0.018*</b>	2.857	1.353	5	Yes

**Notes:** \*Results significant at 95% level ( $p < 0.05$ ), degree of freedom (df) = 27; <sup>1</sup>Mean score based on valid list wise N= 28; <sup>2</sup>Mean score of the cost and affordability factor where 5 = strongly agree; 4 = Agree; 3 = Neutral; 2 = Disagree; and 1 = Strongly agree. R = Ranking of the variables; <sup>2</sup>The higher the mean score (MS), the more critical the cost and affordability factor; Words in bold to highlight the key concept within the variable item

**Table 6:** Ranking of sustainability factors influencing HPPPs projects and *t*-tests.

Sustainability factors	T-test ( $\mu = 3.5$ )	df	Sig (2-tailed)	MS <sup>1,2</sup>	Std. Dev	R	Sig ( $p < 0.05$ )
Sustainability assessment always starts from the feasibility stage	0.593	27	0.558	3.889	1.050	1	No
Sustainability factors are always considered when evaluating project viability	1.400	27	0.173	3.714	0.810	2	No
There is no evaluation mechanism used for sustainability assessment	-1.114	27	0.275	3.357	0.678	3	No
Sustainability assessment always starts at the procurement stage	-2.806	27	<b>0.009*</b>	3.000	0.943	4	Yes
Sustainability is not highly important in PPP projects in Tanzania	-3.615	27	<b>0.001*</b>	2.714	1.150	5	Yes

**Notes:** \*Results significant at 95% level ( $p < 0.05$ ), degrees of freedom = 27; <sup>1</sup>Mean score based on valid list wise N= 28; <sup>2</sup>Mean score of the sustainability factor where 5 = strongly agree; 4 = Agree; 3 = Neutral; 2 = Disagree; and 1 = Strongly agree. R = Ranking of the variables; <sup>2</sup>The higher the mean score (MS), the more critical the sustainability factor.

**Table 7:** Ranking of benefits associated with the delivery of HPPPs projects and *t*-tests.

Benefits	T-test ( $\mu = 3.5$ )	df	Sig (2-tailed)	MS
Encourage private sector <b>innovation and management skills</b>	8.146	26	<b>0.000*</b>	4.42
Possibility of <b>risk sharing</b> between parties	6.099	26	<b>0.000*</b>	4.37
PPP provides <b>value for money (VfM)</b>	2.679	26	<b>0.013*</b>	3.96
Encourage on <b>time delivery</b>	2.702	25	<b>0.012*</b>	3.96
Acceleration of affordable housing provision and <b>improved quality of services</b>	0.716	25	0.480	3.66
Reduction of <b>whole life costs</b> of a project	-0.625	25	0.538	3.38
Average score				<b>3.96</b>

**Notes:** \*Results significant at 95% level ( $p < 0.05$ ), degrees of freedom (df) = 27; <sup>1</sup>Mean score based on valid list wise; <sup>2</sup>Mean score of the variable where 5 = strongly agree; 4 = Agree; 3 = Neutral; 2 = Disagree; and 1 = Strongly agree. R = Ranking of the variables; <sup>2</sup>The higher the mean score (MS), the more important the benefit; <sup>3</sup>R = Ranking <sup>4</sup>IL = Importance level where H = High, M = Medium and L = Low; Words in bold to highlight the key concept within the variable item